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THE SCHOTT METHODS
OF THE TREATMENT
OF
CHRONIC DISEASES OF THE HEART

W. BEZLY THORNE, M.D.



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SIDNEY LICHT, M.D.

1895

THE
SCHOTT METHODS
OF THE
TREATMENT
OF
CHRONIC DISEASES OF THE HEART
WITH
*AN ACCOUNT OF THE NAUHEIM BATHS, AND
OF THE THERAPEUTIC EXERCISES*
ILLUSTRATED
BY
W. BEZLY THORNE, M.D., M.R.C.P.



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P R E F A C E.

IN March, 1891, I was enabled, by the courtesy of the Editors of the *Lancet*, to lay before the medical profession a paper by Dr. Theodor Schott, in which were explained the principles and practice of the treatment of chronic diseases of the heart by means of mineral baths and exercises, which had been elaborated by him and his deceased brother. As judged by results, it attracted no notice and the system remained an unknown art in this country. In the early part of the year 1894 I was favoured with a similar opportunity of bringing forward a brief account of my own experience of the Schott system. Since that time I have received so many requests for further and more detailed information, that I am encouraged to meet an increasing demand by the publication of the following pages. They do not pretend to offer a complete or exhaustive exposition either of the science and art of the physical treatment of heart affections, or of the range of its application. That their scope is mainly limited by my own knowledge and observation, is my apology for defects which are only too manifest to myself.

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53, UPPER BROOK STREET,

LONDON, W.

March, 1895.

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THE SCHOTT METHODS
OF THE TREATMENT OF
CHRONIC DISEASES OF THE HEART.

CHAPTER I.

BAD-NAUHEIM AND ITS WATERS.

SITUATED at the north-eastern extremity of the Taunus range, Nauheim—or, to give it its full name, Bad-Nauheim, the birthplace and headquarters of the treatment about to be considered—lies mainly on the gentle slope, which, looking south south-east, forms the foot of the Johannesberg.

The underground streams which have been brought into requisition for therapeutic drinking and bathing, have been tapped in the lowest part of the township—namely, at some little distance on either side of the stream which divides the park into two unequal portions; and it may be said at once that they rise from so great a depth as to preclude the possibility of subterranean communication with that small river.

The following analyses have been compiled from the observations recorded by Beneke, Prof. Will, of Giessen, Doctors August and Theodor Schott, and Dr. Uloth :—

ANALYSIS OF THE NAUHEIM WATERS.

Quantitative analyses of the Nauheim Waters, by Prof. WILL, Giessen, including the results of analyses by Drs. AUGUST and THEODOR SCHOTT, made especially to ascertain the several proportions of carbonic acid gas. The amounts of solids are given in grammes as contained in 1000 grammes of water.

CONSTITUENTS.	SPRING No. 12. Friedrich-Wilhelms- Quelle.	SPRING No. 7. Grosser Sprudel.	SPRING No. 11. Gas-Quelle.	KURBRUNNEN.	CARLS- BRUNNEN (Dr. Uloth).
Chloride of Sodium	29.2940	21.8245	17.1388	15.4215	9.8600
" " Lithium	0.0536	0.0492	0.0323	0.0267	Trace
" " Potassium (Cæsium, Rubidium).	1.1194	0.4974	0.7174	0.5270	0.0726
" " Ammonium	0.0712	0.0550	0.0433	0.0371	0.0113
" " Calcium	3.3219	1.7000	1.2598	1.0349	1.0575
" " Magnesium	0.5255	0.4402	0.3682	0.7387	0.2040
Bromide of "	0.0083	0.0060	0.0046	0.0063	0.0014
Iodide "	Trace	—	—	—	—
Sulphate of Calcium	0.0352	0.0347	0.0190	0.0238	0.2277
" " Strontium (with Baryta)	0.0499	0.0390	0.0403	0.0324	0.0087
Bicarbonate of Calcium	2.6012	2.3541	2.1473	1.1461	0.9515
" " Iron	0.0484	0.0383	0.0313	0.0262	0.0147
" " Manganese	0.0069	0.0065	0.0050	0.0080	Trace
" " Zinc	0.0089	0.0104	0.0076	0.0070	Trace
Silicic Acid	0.0213	0.0325	0.0190	0.0186	0.0087
Arseniate of Iron	0.0002	0.00036	0.0005	0.00016	Trace
Phosphate "	0.0007	0.00046	Uncertain	0.00034	0.0002
Organic Substances	Trace	Trace	Trace	Trace	Trace
Amount of Solid Constituents	35.3573	26.3539	21.1663	18.6935	12.4183
Specific Gravity	1.0277	1.02088	1.01685	1.01475	1.0089
Free Carbonic Acid Gas	*1.0074	13.1756	1.4136	1.9622	1.4214
Temperature (Fahrenheit), Celsius	(95.54) 35.3	(88.88) 31.6	(81.68) 27.6	(70.52) 21.4	(59) 15
Outflow in 24 hours { Normal	1725	782	529	28	16
in Cubic Meters { Valves half closed	782	159.5	180	16	6
Depth of Well in Meters	180				

* = 578.93 C.cm. + = 1340.46 C.cm.

QUANTITATIVE ANALYSIS OF THE LUDWIGS
SPRING.

By Prof. WILL.

Results given in grammes in 1000 grammes of water.

Bicarbonate of Calcium	0·369	
, " Iron	0·009	
, " Manganese	—	
" " Magnesium	0·113	
" " Sodium	0·172	
Sulphate of Calcium	0·028	
Chloride of Potassium	—	
" " Sodium	0·341	
" " Calcium	—	
" " Lithium.	0·001	
Bromide of Sodium	—	
Silica	0·012	
Organic Substances	Trace	
Total Solids	1·045	
Carbonic Acid Gas contained under pressure of one atmosphere.	1·254	
Specific Gravity at temperature of 66·92° F. 19·40° C.	1·0010	

QUANTITATIVE ANALYSIS OF THE SCHWALHEIM
SPRING.

By Prof. von LIEBIG.

Results given in grains in one pound of water = Grammes in 1000 grammes of water.

Chloride of Sodium	11·9465 gr. = 1·7060
Sulphate "	0·6215 " = 0·0900
Chloride of Magnesium	1·0826 " = 0·1546
Carbonate of "	0·4185 " = 0·0600
, " Calcium	4·3140 " = 0·6160
, " Iron	0·0878 " = 0·0125
Silica	0·1489 " = 0·0212
Total amount of Solid Constituents	18·6188 " = 2·6603
Amount of Carbonic Acid Gas held in solution at the pressure of one atmosphere	22·7258 " = 3·2465
Specific Gravity	1·0022
Temperature	51·8° F. 11·0° C.

The springs which are used for bathing purposes are No. 12, No. 7, and No. 11; those employed for drinking purposes, the Kurbrunnen and the Carlsbrunnen, the Ludwigsbrunnen and the Schwalheimerbrunnen—mainly the former two. It will be observed that the bathing waters are endowed by nature with temperatures which suit them admirably to the purpose. As a matter of fact, it is only in exceptional cases that the waters have to be either artificially heated or cooled by ice.

A course of baths generally commences with the waters of the great Sprudel (thermal bath), freed from more or less of their natural gas, but, in any case, to such an extent as to induce a deposit of peroxide of iron and calcium carbonate, which, floating in the water, produces an opaque yellow coloration. To these, after a time, in increasing portions, are added one, two, three or even more litres of Mutterlauge—the uncrystallisable mother-liquor or waste product of the neighbouring works which provide large quantities of salt for the table. It is rich in chloride of calcium, iodine and bromine. The smallest quantity, carried to the tongue with the tip of the finger, produces an intense burning suggestive of vesication. Next in order comes the Sprudel bath drawn from No. 7 or No. 12, according to the temperature desired, containing a residue of natural gas sufficient to retain the whole of the iron in solution, and to coat the body with unbroken relays of globules which, on the bather emerging from the water, are found to have produced, insensibly, a well-marked rubefacience and an agreeable glow of warmth. Then, finally, come the flowing Sprudel baths, probably the most powerful therapeutic baths known, in which the waters of either No. 7 or No. 12 forcibly enter and, through overflow pipes, leave the

receptable during the whole period of immersion. These, with their constantly rising and simmering globules, emerging from moving water of crystalline clearness, convey the impression of a bath of champagne, and induce a sense of exhilaration not unlike that which is associated with that favourite beverage. No patient, in any case, is allowed to take more than two, or three, or at the outside four, successive baths in as many days, a day of interval always being imposed. Where much infiltration or osteoid deposit has taken place, carefully regulated massage is made to succeed each bath.

Speaking generally, the effects of the baths are:— to lower the frequency and increase the force of the pulse, and to induce a sense of refreshment and invigoration which is shortly followed by a no means disagreeable inclination to avail oneself of the hour's rest, in the recumbent position, which is enjoined as the invariable sequel. One of the more remote effects is to cause pain and even swelling of joints, and sometimes of nerve-sheaths, which have been previously affected by the gouty, rheumatic, or so-called rheumatoid processes. Such a condition generally endures for a few days only, but not only may it last longer, but it may be re-induced by each of the succeeding increments of balneological strength above mentioned. On the more permanent influences exercised in the circulatory and respiratory systems I shall enlarge in detail later on.

The range of morbid conditions which may be relieved by the internal administration and outward use of the Nauheim waters is very wide. They may be divided into those articular and numerous other changes which are dependent on the prolonged presence in the blood-stream of uric acid in excess, chronic affections of the heart and blood-vessels, with

one notable exception; congestion of the abdominal and pelvic viscera; and the earlier stages of chronic affections, of the congestive or sub-inflammatory order, of the spinal nerve structures.

I propose, however, in this notice, to confine my observations to the systematic use of the saline baths and of regulated movements of the body in chronic affections of the heart, according to methods elaborated after years of careful study by Dr. Theodor Schott and his deceased brother, Dr. August Schott.

CHAPTER II.

BATHS.

IT has already been stated that the immediate effect of immersion in the Nauheim baths is to reduce the frequency and increase the force of the pulse. For example, at a time when my own pulse averaged 74 beats per minute in the recumbent position, and 84 in the sitting, the heart and vessels being sound, I found it, on four separate occasions, to have fallen, within two minutes of immersion in a Sprudel bath, to from 60 to 64. In ten minutes it had risen to from 66 to 68, and there remained during the period of immersion which in no case exceeded fifteen minutes. The exertion of dressing raised it to from 76 to 78 ; but, after the prescribed recumbent position had been assumed, it returned to from 62 to 66, with increased volume, and so remained during the period of repose. It will, therefore, be observed that the influence of the bath was not limited to the period of immersion.

These observations were made in August, 1893, and were verified a year later in the course of a series of five-and-twenty baths. Dr. John Broadbent was present during the twelfth, and having traced

the area of cardiac dulness before and after immersion, certified to a recession, averaging one third of an inch, in the general outline traced from the sternal to the mammary region.

By way of contrast, the following case may be quoted. A patient, aged forty-six, whose health had been declining for several years, was found to have a pulse of 80 in the recumbent, and of 88 in the sitting, position. While he stood it varied from 100 to 104; and if he walked ten paces it rose to from 120 to 130. The apex was found to beat an inch outside the nipple line. Within two minutes of immersion in his first thermal bath (spring No. 7, divested of the greater part of its carbonic acid gas, temp. 90°·5 F.) the pulse had fallen to 70, and, judged by the finger, appeared to have doubled in volume; at the end of four minutes it was 68; in six minutes 66; in eight minutes 68; and while standing, after dressing, it was 90. Before he left the bath, after an immersion of ten minutes, the apex beat was found to have receded half an inch in the direction of the mesial line; and nails and fingers, which had been snow-white up to the junction of the second with the first phalanx, had assumed a healthy flesh tint.

The immediate effect of the first few baths is to produce a sense of oppression at the praecordia, under the influence of which the patient breathes slowly and deeply for two or three minutes. Respiration then becomes easy and continues slower by from two to four breaths a minute.

The effect on the peripheral vessels is to increase their carrying power. A glowing sense of warmth is experienced in the extremities and in the surface of the body generally. The veins are stimulated to a

similar activity. In fact, the general vascular capacity, systemic and pulmonary, is increased, and, without loss of blood, the relief of a general bleeding is afforded to an overloaded and labouring heart.

Such being the results of a carefully graduated and regulated series of immersions in these saline waters, it can scarcely be matter for surprise that in three or four days, especially in cases in which the flow of urine has been scanty, there ensues a free diuresis which may continue for days or weeks ; that metabolic change becomes accelerated and improved ; that deeply-seated organs, more especially the liver and pelvic viscera, are relieved of congestion and partake in the general impulse to functional health ; and that the heart, relieved of its burden, and contracting fully and without hurry on its contents, derives from an improved coronary circulation materials for the repair of its weakened or damaged tissues. It is suggested by Dr. Schott that these effects are produced partly by the cutaneous excitation induced by the mineral and gaseous constituents of the waters, and partly by a more prolonged stimulation of the nerves of sensation excited by imbibition into the superficial layer of the corium. According to this hypothesis, each sensitive nerve branch distributed over the surface that has been immersed, transmits to its parent centre an influence which is centrifugally reflected to the vasmotor system and to the ganglia which control the action of the heart. That the nerve centres are brought under powerful influence is attested by the remarkable trophic changes which may be observed to follow a course of these baths, unaided by the internal use of mineral waters or pharmaceutical remedies, in cases of anaemia, wasting, neurasthenia, and, above all, in cases of osteoarthritis.

The rehabilitation of the trophic, and probably of other central nerve tissues, is so lasting that progressive improvement may be observed for three or four months after the completion of the course. It need hardly be pointed out that such a process of general health restoration is a factor of scarcely secondary importance in cases in which the condition of the heart claims the attention of the physician as the main indication for treatment.

It is necessary here to state that it is not claimed that these waters are unique in their therapeutic influences; on the contrary, from the earliest days, Dr. Schott and his brother have insisted that similar, if not indeed identical, effects may be derived from baths artificially prepared so as to resemble the Nauheim waters in their principal mineral ingredients. Thus, in severe cases, it is recommended that the treatment should commence with a 1 per cent. solution of chloride of sodium, and that the strength should be gradually raised to 2 or 3 per cent. For increasing the cutaneous excitation, chloride of calcium is the salt to be relied on. The initial strength of the bath with regard to that ingredient should be 0·2 per cent., approximatively that of No. 7 spring, and, by increasing additions, it may be raised to 0·3 per cent., that is to about the strength of No. 12 spring, and eventually to 0·5 per cent. Such varying degrees of concentration may be obtained by the proportional use of the crystallised Nauheim bath salt, of the mother-lyc, and of Mediterranean sea residue which also contains chloride of sodium and of calcium in the proportions necessary for the preparation of initial baths, together with traces of bromides and iodides.

For the production of carbonic acid effervescence

the action of hydrochloric acid on bicarbonate of soda is relied on. As a state of chemical purity is not required by the circumstances of the case, the articles of commerce are sufficient for the purpose. Two ways of employing the reagents are suggested, the one calculated to induce slow and gradual, the other rapid and almost immediate, effervescence. In the case of the first, the various salts, including the requisite proportion of bicarbonate of soda, having been dissolved, a bottle containing the acid is laid at the bottom of the bath, and the stopper having been withdrawn it is moved about from time to time. The bath will be ready for use in two or three hours. For the more rapid production of effervescence, the stopper of the bottle containing the acid is loosened but retained in position, the bottle having then been inverted and lowered until its mouth is just below the surface of the water, the stopper is withdrawn, and the bottle is moved about so as to diffuse a layer of acid as uniformly as possible over the surface of the bath. By this means the bath will be prepared in about five minutes. It will be useful to employ baths of three degrees of effervescence :

Mild	$\frac{1}{2}$ lb. NaHCO ₃ to $\frac{3}{4}$ lb. HCl (25 per cent.)
Medium	1 lb. NaHCO ₃ to $1\frac{1}{2}$ lb. HCl.
Strong (Sprudel strength)	...	2 lbs. NaHCO ₃ to 3 lbs. HCl.		

Except in the case of porcelain baths it is desirable to ensure a slight excess of alkali in order to prevent corrosion.

As evidence of the fact that the virtues which are claimed for the Nauheim waters are not peculiar to them, it may be interesting to record the result of some observations recently made on the effects of baths consisting of the waters of Llangammarch Wells in Breconshire, the mineral constituents of which, according to an analysis made by Dr. Dupré in 1883, are as follows :—

	Parts per 1000.
Chloride of Sodium ...	189·56 2·708
Chloride of Calcium ...	84·56 1·208
Chloride of Magnesium	24·31 0·350
Chloride of Barium ...	6·26 0·090
Carbonate of Calcium	2·80 0·040
Silica	1·40 0·002
<hr/>	
	308·89 grains per gallon.

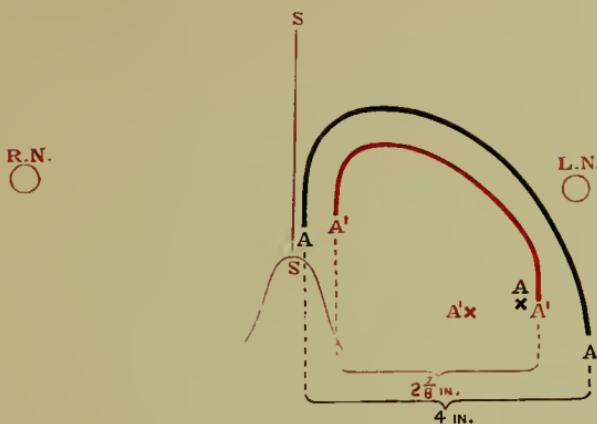
Iron Protoxide a trace.

Potassium	}	Minute traces.
Strontium		
Lithium		
Bromine		

Mr. S. A. Vascy, F.I.C., F.C.S., kindly permitted the first experiment to be made on himself, and the observations were made by Mr. Hugh Bennett, M.R.C.S., L.S.A., of Builth, and myself. The pulse, before immersion, was 100. From the second to the eighth minute the same oppression of the breathing which ensues on immersion in a Nauheim bath was experienced. At the eighth minute the pulse was found to be 78 ; after an immersion of ten minutes it was 76 ; after dressing 86, and an hour later 82. The change which was effected in the area of cardiac dulness is shown in the accompanying diagram (I). The temperature of the bath was 92° F.

NOTE.—Areas of cardiac dulness and apex beats indicated by red lines and crosses, respectively, refer to observations made after either baths or exercises.

DIAGRAM I.



A A, area of cardiac dulness before immersion in bath of Llangam-march water. Temp. 92° F.

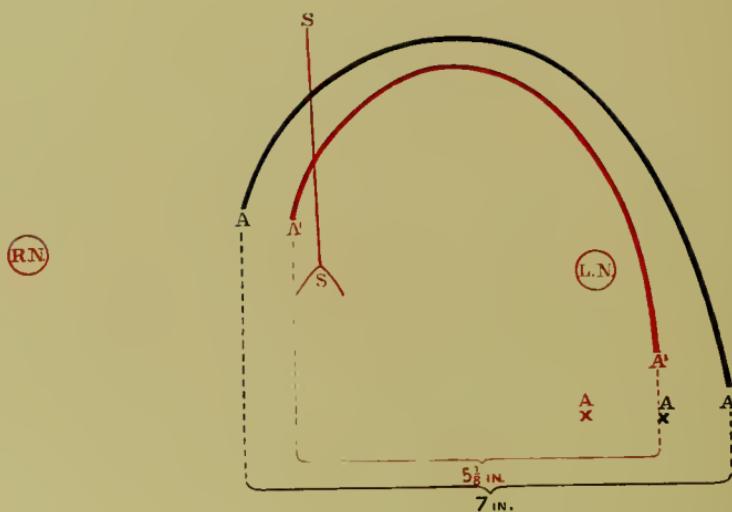
A' A', the same after ten minutes' immersion.

A X and A' X, positions of apex beat at corresponding stages.

R.N. and L.N., right and left nipples.

S S, mid-sternal line.

DIAGRAM II.



A A and A' A', before and after eight minutes' immersion in a Llan-gammarch-Nauheim bath.

A X and A' X, positions of the apex beat at corresponding stages.

R.N. and L.N., right and left nipples.

S S, mid-sternal line.

The next observation was made on myself by Mr. Bennett. Before undressing the pulse was 96.

On immersion it fell at once to	80
At the end of the 1st minute it was	68
,, ,, 2nd ,, ,,	69
,, ,, 3rd ,, ,,	72
,, ,, 4th ,, ,,	73
,, ,, 5th ,, ,,	74
,, ,, 6th ,, ,,	70
,, ,, 7th ,, ,,	68
,, ,, 8th ,, ,,	72
,, ,, 9th ,, ,,	76
,, ,, 10th ,, ,,	77

The recession of the area of cardiac dulness at the sternal end of the arc was $\frac{1}{2}$ inch, and at the apex $\frac{3}{8}$ inch. The temperature of the bath was 89° F.

A third observation was made on the following day by myself on a woman aged forty-seven, the subject of aortic stenosis, albuminuria, partial ascites, and oedema of the lower extremities. In this instance the strength of the bath, in chloride of sodium, was increased to that of the Nauheim spring No. 7. Before an immersion of ten minutes the pulse was 92, and after it 88; when the patient was partly dressed it was 84. The temperature of the bath was 92° F. The accompanying diagram (II.) shows the diminution which was effected in the area of cardiac dulness.

In each of the above three cases an increase in the volume of the pulse similar to that effected by the Nauheim baths was found to take place, but the after-glow which followed immersion in the bath, which had been strengthened by the addition of

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chloride of sodium, appeared to be greater than in the other two instances. These observations tend to prove the correctness of Dr. Schott's disinterested contention that the Nauheim baths enjoy no monopoly of heart-therapy.

The following sphygmographic tracings and notes of pulse pressure, as recorded by the sphygmomanometer, are borrowed from a paper of Dr. Theodor Schott's, which I was the means of laying before the medical profession in Britain in 1891,* and afford evidences, which might be indefinitely multiplied, of the invigorating influence which the baths exercise on the heart and the circulation.

Tracings taken from a patient aged thirty-one, suffering from cardiac weakness.

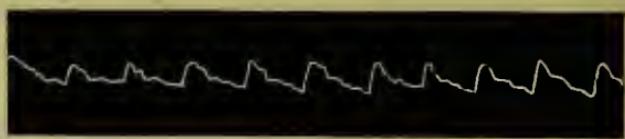


FIG. 1.

Before bathing: Frequency of the pulse, 94; pressure of the pulse, 120 millimetres of mercury.

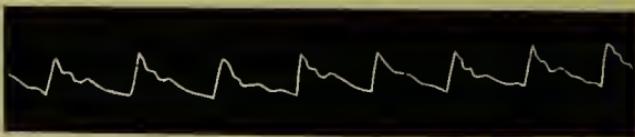


FIG. 2.

After the use of a Nauheim effervescent mineral bath of 87° F., duration fifteen minutes: Frequency of the pulse, 72; pressure of the pulse, 140 millimetres of mercury.

* Lancet, May 23rd and 30th, 1891.

Tracings taken from a patient aged forty-six, affected with stenosis ostii arteriosi sinistri. Exercises were superadded to baths on the ninth day of treatment.

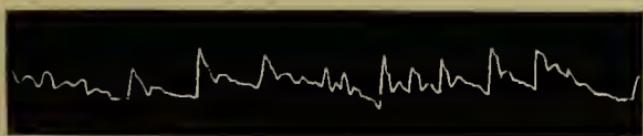


FIG. 3.

Before the beginning of the treatment the pulse could not be counted (more than 150); pressure of the pulse, 82 millimetres of mercury.

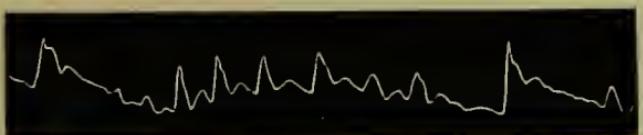


FIG. 4.

After the first bath, containing 1 per cent. of salt, temperature 89.5° F., duration ten minutes.

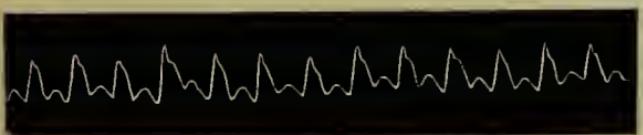


FIG. 5.

Eighth day of treatment by baths: Frequency of the pulse, 144; pressure of the pulse, 95 millimetres of mercury.

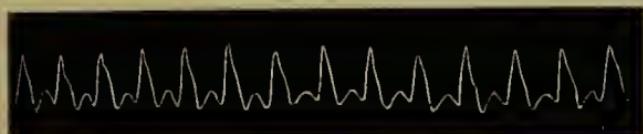


FIG. 6.

Ninth day of treatment, after half-an-hour's exercises with resistance: Pressure of the pulse, 110 millimetres of mercury.



FIG. 7.

Fourteenth day of treatment: Frequency of the pulse, 108; pressure of the pulse, 115 millimetres of mercury.



FIG. 8.

After three weeks' treatment: Frequency of the pulse, 108: pressure of the pulse, 125 millimetres of mercury.

CHAPTER III.

THERAPEUTIC MOVEMENTS.

THE treatment of cardiac affections, as practised by Dr. Schott, is not, however, limited by the therapeutic influences of the baths. As the result of a series of elaborate and prolonged experiments carried out by him and his deceased brother, Dr. August Schott, a system of exercises has been devised which yields results, if anything, still more remarkable. Their effect is illustrated by the following records, which were made by myself in conjunction with Dr. Hermann, of Charkoff, in August, 1893. The patient was a stout, well-built, fresh-looking man, forty years of age. He brought letters from Professor von Jörgensen of Tübingen and from his brother, who is a medical man, both of which described him as having been addicted to alcoholic excesses and being the subject of *cor adiposum*. Before the exercises the heart sounds were barely audible through a binaural stethoscope, and the apex beat was inappreciable. There was some oedema of the lower extremities.

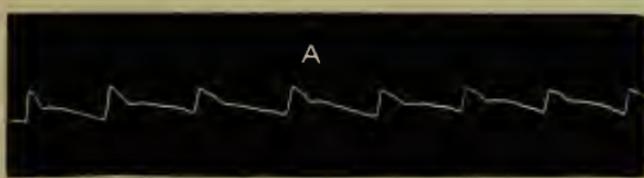


FIG. 9.
Before exercises.

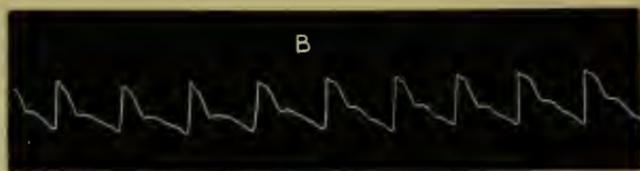


FIG. 10.
After twenty minutes' exercises.

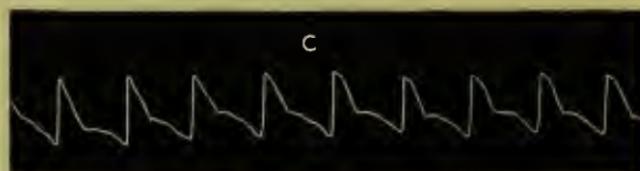


FIG. 11.
After thirty-five minutes' exercises.



FIG. 12.
After forty-five minutes' exercises.

The following diagram (Fig. 13) gives, on a reduced

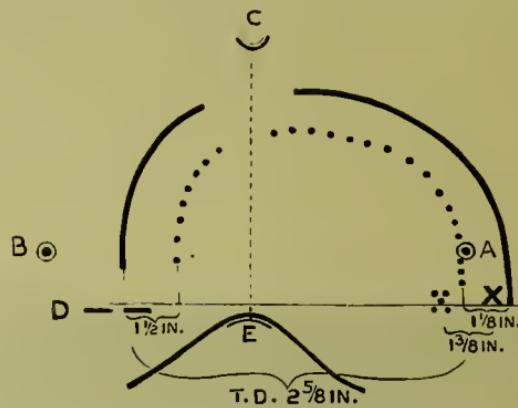


FIG. 13.

A, left nipple; B, right nipple; C, fossa jugularis; D, upper level of hepatic dulness; E, ensiform cartilage; T.D., total diminution of area of cardiac dulness; X, position of apex beat.

scale, the tracings of the area of cardiac dulness which were taken before, and at the conclusion of, the same exercises.

These exercises have been denominated by their inventors "Widerstandsgymnastik," or gymnastic with resistance. They may perhaps be more conveniently termed resisted movements or exercises. They consist of movements calculated to bring into successive and regulated action almost every collective system of voluntary muscles which is comprised in the human frame. Each succeeding movement is resisted by an attendant to such an extent as to oppose without arresting it. They consist of slowly-conducted flexion and extension, adduction and abduction, and rotation, in orderly succession, of the arms, the trunk, and the lower extremities. Each movement must be slowly and evenly made with a definite and uniform effort on the part of the patient. The office of the attendant is not limited to resisting the movements with equally uniform, but slightly inferior, force, but it is his duty to impose a short interval between each movement, to enjoin slow and regular breathing, and, more especially, by observing the rate of breathing and its force as indicated by the alæ nasi, to ensure that no undue strain is placed on the heart and lungs. He is also charged to guard the patient from perspiration and the slightest approach to palpitation of the heart. Either of these indications must be the signal for an interval of repose, during which the part being exercised is either left to hang at rest, or is supported by the hand of the attendant, who, under no circumstances, is allowed to grasp or in any manner constrict any portion of the patient's body. As the course proceeds, the energy of the movements, and consequently the force of the resistance, are gradually increased. Before and after the séance, and, if necessary, at some

intermediate period the physician maps out the dimensions of the heart by percussion, to satisfy himself that the effects of the exercises are satisfactory. The results, in fact, are such as would scarcely be believed by any but an eye-witness. It is by no means uncommon, in cases of dilatation, to see, within one hour, the oblique long diameter of the heart's area of dulness diminish by from three-quarters of an inch to an inch and a quarter, and, perhaps more surprising still, to observe a diminution of as many as two inches, in vertical measurement, of a liver which at first extended to the umbilical level ; and to hear the patient, at the conclusion of what cannot be described as an ordeal, volunteer the statement that a load has been removed from the præcordia, that he breathes easier and more deeply, and experiences a sense of general relief.

It is not suggested that the whole of such a gain is permanent, for in the time that intervenes before the next day's exercises or bath, as the case may be, the dilated and congested organs tend to their former dimensions, but, be it well observed, they do not wholly relapse. On the contrary, each contraction ensures a proportional permanent gain, until, at the end of a few weeks, the attenuated and dilated heart and the congested liver have recovered either their normal dimensions, or, at any rate, such contraction and compensatory power in the one case and resolution in the other, as constitute them practically sound.

The resources of Dr. Schott and his brother did not come to an end with the conception of this system of physical treatment. With a view to enabling physicians and patients to maintain treatment of the same kind without resorting to Nauheim, they devised a method in the practice of which the patient is instructed, himself, to supply the resistance for which he would otherwise be dependent on a second person ;

and, by the aid of these self-resisted movements he is able to carry on and, from time to time if need be, resume a therapeutic process of unquestionable value.

In the course of his memorable lectures on surgical pathology, Sir James Paget quoted the profound observation of Treviranus that "each single part of the body, in respect of its nutrition, stands to the whole body in the relation of an excreted substance." In view of what may be achieved by means of the Schott system of therapeutic exercises, we may go further and say that each part of the body, through its motor nerves, is capable of exercising a health-sustaining, and in some cases a health-restoring, influence on the heart and circulatory system. It has been shown that, even in health, the heart may present, under the alternating influences of exercise and repose, very appreciable variations in size; and Stokes long ago insisted that exertion, under suitable conditions, may promote the health of a damaged heart. On the other hand, there are not wanting examples of hearts that have been morbidly dilated, and to that extent damaged, either temporarily or permanently, by strains disproportionate to their strength. Drs. August and Theodor Schott enjoy the distinction, and are entitled to the credit, of having brought the physiological relations of exercise, function, and repair, into obedience to a therapeutic system which yields results in the treatment of diseases of the heart hitherto unknown and unlooked for. Such service brings honour to their profession and deserves the gratitude of mankind.

What has been said of the influence of the baths applies equally to the therapeutic exercises, except that retardation of the pulse is not so rapidly effected, even though its force and volume be manifestly increased; and that, in the nature of things, it would

not be desirable to prolong immersion beyond fifteen or, even in cases of exceptional tolerance, twenty minutes ; while, on the other hand, there are few patients who may not be kept under exercise for half an hour, and some can undergo an hour's treatment without fatigue. There are, therefore, in matters of secondary detail, differences between the baths and the exercises, and it rests with the physician to decide whether one should be brought into requisition to the exclusion of the other, or both be employed at suitable times and intervals.

As with the baths so with the exercises, therefore, the following immediate results may be looked for in the majority of patients afflicted with a damaged or weakened heart : retardation of the pulse and increase of its force ; contraction of the heart, generally first on the right side (it is rare for the left ventricle not to share in the contraction) ; slower and deeper breathing with a sense of lightness and relief in the chest ; a better colour of the lips, and improved faecal aspect ; and, where that organ is congested, a marked diminution in the dimensions of the liver. Systematic administration of the exercises is generally followed in a few days by marked, and often long maintained, diuresis. That the diminution in the area of dulness is not due to increased pulmonary inflation and consequent overlapping of the heart, is shown by the fact that the position of the diaphragm remains unchanged, or, if it moves, it does so in an upward direction. The accentuation and migration towards the mesial line of an apex beat, which is appreciable to both sight and touch, afford evidence which, to most minds, is convincing.

In the course of the first few movements a bruit, due to stenosis, may be observed to become accentuated ; before the series has been completed mur-

murs, resulting from valvular insufficiency other than that caused by actual lesion, may be diminished, then modified to duplication, and finally obliterated; heart sounds which were barely to be heard may become audible; and an apex beat that could not, under any circumstances, be detected is readily appreciable to the touch.

The increase of the general vascular capacity is not less striking in the case of the exercises than the baths. Within a few minutes the size of radial artery, as gauged by the touch, may seem to have doubled, and, before the series of movements has been completed, cheeks and fingers that were cold and either white or bluish-red, glow with warmth and healthy colour. The motor nerves, called into orderly, regulated, and, above all, not exhausting activity, seem to exercise centripetal and reflex influences similar to those which are brought into action by the baths through the nerves of sensation. The increased capacity of the vessels, down to the smallest capillaries, enables the heart so to contract as to empty its cavities at each stroke; while, at the same time, the ganglia, which control its action, seem to enforce a tonic contraction, which, renewed and maintained from day to day, leads to the establishment of a better habit of both function and repair.

It may be well, now, to gather together in brief summary the effects of these simple but wonder-working movements, and I am favoured with permission to do so by quoting the following lines from the admirable and lucid article of Sir Philip C. Smyly, which recently appeared in the *Dublin Journal of Medical Science* (September, 1894):—

“Take for example, the four following phenomena:—

<ol style="list-style-type: none"> 1. The colour before the movements is a purple-blue in the cheeks and hands and feet. 2. The forehead, neck, and ears, etc., are a waxy white. 3. The pulse is rapid and blood-pressure low in the arteries. 4. The area of dulness over the heart is large. 	<ol style="list-style-type: none"> 1. The colour after twenty minutes or so becomes red, and the blue gradually disappears from the hands and feet. 2. The forehead, neck, and ears, etc., become pink. 3. The pulse slows and becomes full, the blood-pressure rises. 4. The area of dulness diminishes at times as much as an inch or more in diameter.
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These results are due to :—

1. Increased arterial circulation, due to “the diminution of peripheral resistance.” *
2. Diminished venous congestion, due to larger quantity of red blood in the arteries.
3. Diminished work for the heart, due to the free circulation of the blood in the arteries.

. there will ever be a feeling against this treatment until it is clearly seen and believed to be true :—

1. That the movements relieve the back pressure on the heart.
2. That the diminution in the size of the heart is due to the absence of excess of blood in its cavity.
3. That this is attained by there being more room in the arteries.

* “Mechano Therapy,” A. Symons. Eccles. Pract. Aug., 1894, p. II4.

4. That the heart muscle gains strength by having room to contract.
5. That the contraction being more complete, it takes a longer time, thus making the pulse slower, and, at the same time, fuller.
6. Being able to send on more blood it is ready to receive more, and thus removes venous congestion.
7. The strength gained by the heart is due to the freedom to contract fully."

Dr. Schott affirms that benefit may be expected to accrue in all cases of chronic heart disease whether of valvular or parietal incidence, except where the myocardium has reached an advanced state of degeneration, or the vessels are the seat of advanced arterio-sclerosis. I have myself been witness of improvement amounting to practical or actual cure in cases presenting the physical signs usually regarded as indicative of the following affections: stenosis of either the aortic or the mitral orifices; stenosis of both; insufficiency of either or both, with attendant dilatation; dilatation consequent on myocarditis, on habitual haemorrhage and on constitutional anaemia; fatty heart (interstitial); weakened heart; congenital mitral insufficiency; patent foramen ovale; and angina pectoris of apparently both neurotic and organic causation. It is reasonable to assume that measures, calculated to diminish peripheral resistance, and to promote the nutrition and repair of the cardiovascular tissues, must be applicable to, at least, the early stages of aneurism of the heart and great vessels.

The diagnostic and prognostic value of the exercises must not be overlooked. Familiarity with the effects which they may be expected to produce

on healthy and on weakened walls enables the physician to detect early stages of dilatation, the existence of which it might otherwise be difficult or impossible to recognise. More pronounced dilatation may be readily differentiated from parietal hypertrophy, superineumbent fat, and pericardial effusion or infiltration. The measure of contraction induced by a few exercises readily discloses whether an abnormal area of dulness is to be attributed to dilatation or to a substantial mass of unyielding tissue. As regards prognosis, valuable information may be derived from the rate at which praecordial dulness is reduced, and, after a few days, by ascertaining before the bath or exercises, as the case may be, the amount of more than temporary contraction which has been secured. Lastly, an unsuspected valvular lesion may be betrayed by the development of a bruit while the movements are in progress.

A question of no secondary importance is: May such recovery of heart-power and efficiency, together with the improvement in the general health which is contemporaneously effected by the systems under consideration, be so enduring as to justify, in the greater number of instances, the return of the patient to the cares and labours of an active life? From my own observation, and from the testimony of other observers, I am able to reply that such is the case.

CHAPTER IV.

SPECIAL CONDITIONS TO WHICH THE SCHOTT SYSTEM IS APPLICABLE.

THE value of therapeutic measures which are capable of promptly relieving an over-burdened and labouring heart, without recourse to either general bleeding or drugs the use of which may sooner or later be attended with toxic, or, to say the least, undesired effects, is so obvious that it stands in need of no elucidation. Once it is recognised that the whole circulation, arterial, capillary, and venous, systemic and pulmonary, may thereby be stimulated to healthy activity and normal function, and that such health-restoring effects may, under careful and judicious direction, be maintained, progressively increased, and eventually confirmed without risk of injury or drawback to the patient, it must be apparent that they may be applied with advantage to the relief of troubles which are not commonly considered to be exclusively cardiac in their origin and incidence. The principal typical affections of the heart to which they are applicable have already been enumerated, and, with reference to them, it need only be pointed out that, speaking generally, the baths, as compared with the exercises, offer special advantages for the treatment of those cases in which a rapid, feeble, and, perhaps, also irregular or intermittent pulse is the

expression of cardio-vascular degeneration, whether there be co-existing valvular lesions or no. But it should be pointed out that in some extreme cases in which either the cardiac condition itself, or some dependent or independently existing complication forbids the removal of the patient from his bed, the exercises, modified, if need be, to suit the special circumstances of the case, may prove to be of value in preparing the patient to undergo treatment by baths, more especially if they should not be easy of access. The exercises, on the other hand, may be at once brought into use, with or without the auxiliary influences of the baths, to meet either failure of compensation, or, cases in which degeneration has not led to a marked failure of physical power and general health. In severe cases, and whenever it is desired to produce a speedy effect, the combination of the two methods may be expected to yield results which could not be secured by means of either employed alone.

It now remains to enumerate some of the conditions, not primarily or ostensibly cardiac, to which the methods under consideration may be applied with advantage.

First in order, and perhaps most obviously, come those which are associated with the presence of uric acid in the blood in excess. Such are those in which the sequelæ of acute rheumatism, such as peri-, myo-, and endocardial lesions co-exist with injury to joints and tendons. What has been said of the resolvent, metabolic, and trophic effects of the baths points to them as remedial and restorative agents of the first order of efficacy, especially when their direct effect in contracting the heart and nourishing its tissues is borne in mind. Where myocardial changes have left a legacy of dilatation and feeble

action, and the structures, entering into the composition of the joints, have either escaped injury or enjoyed the advantages of effectual resolution, the exercises alone may meet the requirements of the case. The same indications apply to the subjects of acute and chronic gout. Cases of dilatation, weakened heart, or special lesion occurring in the course of osteo- or rheumatoid arthritis stand, however, on different ground. When the central and trophic influences which, according to Dr. W. M. Ord and others, play a prominent part in this affection, as well as the measure of neurasthenia and the profound cachexia which frequently arise in conjunction with the arthritic changes characteristic of the disease, are taken into consideration, it will be apparent that the treatment by baths is calculated to relieve at one and the same time such cardiac troubles as may have arisen, and the other local and general conditions to which allusion has been made.

The weakened heart which influenza so often leaves in its train, probably as the result of myocarditis, is readily amenable to the exercises alone. In some such cases murmurs may be detected, mostly basc-systolic. They are probably due to orificial irregularity or dilatation, for they are generally subdued by the first few movements. Sometimes they recur in the course of the earlier intervals; but I have not met with any, not previously existent, which have survived a full course of the movements (Cases D and E, Ch. VI.).

The effects of both baths and exercises, whether singly or conjointly employed, are very remarkable in anaemia associated with more or less dilatation, whether chlorotic, malarial (Case A, Ch. VI.), or arising from loss of blood or chronic intestinal catarrh. In the first two classes of cases it is

common to see the colour, digestion, spirits, energy, and general health of the patient undergo a notable improvement within three or four days, under the influence of the exercises alone—that is, without either baths or a single dose of arsenic or iron. A course of four or five weeks, combined with due precaution as to diet, exercise, and general hygiene, is usually sufficient to ensure a return to health. In the two other classes of cases, it need not be said that the physical treatment should be combined with measures calculated to arrest the waste which the system has suffered. The effects of both methods, especially when combined, have been no less satisfactory in such cases of œdema, anasarca, serous effusion, and albuminuria associated with deficient heart power as, under my observation, have submitted to the treatment. Case J. (Ch. VI.) is one in point.

The Schott methods bring great relief to such cases of asthma, associated with however little cardiac dilatation, as have come under my treatment. I may mention three typical cases: α , is a lady of middle age who, on taking a drive, or in any way coming near a horse, experienced the following train of symptoms:—intense injection of the ocular and palpebral conjunctivæ, nasal defluxion, hoarseness, and the breathing characteristic of spasmodic asthma. After a week of baths she was able to take a long drive with relative impunity, and, as the course proceeded, the improvement continued until finally the symptoms were scarcely appreciable. A slightly dilated heart had resumed its normal dimensions within the first week, and the pulse had become uniformly stronger and fuller.* β , is a lady, thirty-six years of age, who has been liable, with increasing frequency and severity, to accesses of eczema,

* The benefit has, in this case, been maintained for five months.

intestinal catarrh with abilious stools, bronchitis with profuse muco-purulent expectoration, and asthma with nocturnal exacerbations of great severity. The effects of driving were similar to those experienced by α . When she came under treatment she had not been able to lie down for a fortnight, and could secure only a few snatches of sleep with the aid of the fumes of a well-known anti-asthmatic powder. The lungs were emphysematous, and the apex beat was two inches outside the nipple line. During the day, any slight exertion induced cardiac dyspnœa and praecordial distress. Within three days of commencing a course of exercises, all the symptoms had so improved that she could lie down at night and obtain unbroken sleep for two or three hours at a time. At the end of a fortnight the anti-asthmatic inhalations were discontinued. On the conclusion of a course of five weeks (inclusive of the menstrual interval) she enjoyed good nights, could go up and down stairs without the breathing being affected, take long walks, and drive, with scarcely appreciable inconvenience, through the streets of London in hot, dry, and dusty weather. The apex beat had receded two inches and was in the nipple line.* γ , differs from the preceding in having passed the climacteric period by about two years, and in the emphysema being more pronounced. For seven years she had only obtained sleep by being pillow'd up and inhaling the fumes of nitre-papers, and outdoor exercise had been limited to slow rambling walks in the garden of her country residence. The exercises alone were employed. The nocturnal asthmatic exacerbation, from day to day, occurred a little later and lasted a shorter time. In the course of the second week, the nitre-papers were abandoned, and good nights were

* The benefit has been maintained for seven months.

enjoyed in the recumbent position. On the conclusion of a five weeks' course, the apex beat had receded from an inch without to half an inch within the nipple line. When last heard of, eight months later, the patient was taking a country walk of about a mile every day, and leading a fairly active life.

I have mentioned these cases with some detail because they seem to open up a prospect of relief to a class of sufferers whose troubles have hitherto, to a great extent, defied treatment. The results recorded are, however, not surprising when considered in the light of what has been shown to take place in the relief of a burdened heart, and the improvement of the capillary circulation. It can scarcely be doubted that the congested and varicose veinlets which encumber the alveoli in such cases, share in the general change for the better, and that the circulation through the pulmonary circuit is quickened, and the aëration of the blood proportionately facilitated, by the increasing systemic arterial and capillary capacity and activity. Be that as it may, it needs no argument to show that an asthmatic patient is in better case when strong and well-contracting heart-muscles propel the blood-stream through channels which offer a reduced, and perhaps no more than a normal resistance. In this connection I may state that convalescence from acute bronchitis and from pneumonia may be favourably influenced by recourse to the movements, more especially as regards the drying up of moist exudations.

A considerable proportion of the subjects of cardiac dilatation are also affected with frequently recurring distension of the stomach, or with chronic dilatation of that organ. These conditions generally subside *pari passu* with the improvement in the state of the heart without special treatment.

The changes in the general circulation, and more especially in the peripheral vessels and the capillaries, which lead to habitual coldness of the extremities with a deep bluish-red colour of the hands which gives place to a white hue on pressure, but returns the moment the pressure is relaxed, and not infrequently similarly affect the colour of the cheeks and of the tip of the nose, yield equally well to both baths and exercises where they have not become hopelessly confirmed. Two out of three cases which I have treated by the latter method have been apparently cured. In one of them an habitual headache, which, with occasional variations of intensity and a few complete intervals, had existed for about seven years, was effectually relieved. The patient is a lady twenty-two years of age. The one in whom the treatment produced only partial and temporary relief, and no permanent benefit, is over thirty years of age and, also, the subject of habitual headache with occasional accesses of acute hemicrania. A man seventy-four years of age who, for four months, had been troubled with habitual headache associated with the evacuation of uric acid crystals and accesses of lumbago, was relieved of the headache in four days. The exercises were persevered with for a month, and the apex beat which had been found an inch outside, receded to a point half an inch within, the nipple line.

Of six single women, under the age of twenty-five, who habitually suffered acutely during the first hours of the menstrual period, five reported that they were unconscious of discomfort during the initial stage of the first menstrual period which occurred after the exercises had been commenced. In the three cases of which I have been able to obtain subsequent information, the relief has been permanent. I have observed the same result to follow the baths.

This brief notice of what may be called the secondary or indirect results of a treatment which is more especially directed to the heart, would be incomplete if I were not to allude to its psychological influence. No one can have observed the subjects of cardiac inefficiency, especially those who are affected by either simple dilatation, or by that condition associated with valvular lesion and failure of compensation, without being struck with the nerve-tension and mental suffering which they endure. Intolerance of sound, irritability, difficulty of mental concentration, lessened power of work, depression amounting, in some cases, to despondency, and night alarm, are of common occurrence. With the rehabilitation of the heart and vessels which these methods of physical treatment are so successful in inducing, all such nerve-suffering vanishes like a dream, and the spirits rise to a plane of hope and energy which is surprising alike to the patient and the physician (Cases C and D, Ch. VI.).

CHAPTER V.

THE EXERCISES.

“ Movements without design weaken the heart ; movements with design, on the contrary, strengthen the heart.”—THEO. SCHOTT.

[*For the illustrations contained in this chapter I am indebted to the joint labours of Mr. Macdonald Gregory, one of my assistants, and of Mr. Prendergast Parker, the artist.—W. B. T.]*

In approaching the subject of the movements which have been shown to exercise therapeutic influences over the heart and blood-vessels, which place the drugs hitherto relied on completely in the shade and relegate them to the position of occasional auxiliaries, it cannot be too clearly stated that we have not to do with “gymnastics” in the sense in which that word is usually employed in the English language. They do, doubtless, in the end promote the development of the muscles generally, but that is not their primary object. It should be distinctly understood that they are designed to produce regulated movement with *little exertion and no fatigue.*

The person who administers them, who may be called the “operator,” should strictly observe and enforce the following rules :—

1. Each movement is to be performed slowly and evenly, that is, at an uniform rate.

2. No movement is to be repeated twice in succession in the same limb or group of muscles.

3. Each single or combined movement is to be followed by an interval of rest.

4. The movements are not to be allowed to accelerate the patient's breathing, and the operator must watch the face for the slightest indications of : (a) dilatation of the alæ nasi ; (b) drawing of the corners of the mouth ; (c) duskiness or pallor of the cheeks and lips ; (d) yawning ; (e) sweating ; and (f) palpitation.

5. The appearance of either of the above signs of distress should be the signal for immediately interrupting the movement in process of execution, and for either supporting the limb which is being moved, or allowing it to subside into a state of rest.

6. The patient must be directed to breathe regularly and uninterruptedly, and should he find any difficulty in doing so, or for any reason show a tendency to hold his breath, he must be instructed to continue counting, in a whisper, during the progress of each movement.

7. No limb or portion of the body of the patient is to be so constricted as to compress the vessels and check the flow of blood.

The following are the movements :—

No. 1.—The arms are to be extended in front of the body on a level with the shoulder joints, the palms of the hands meeting in front of the chest (Fig. 16). The operator places his hands on the outer surface of the patient's wrists in such a manner that the ulnar side of the patient's wrist rests in the fork between his own thumb and forefinger. He places one foot in front of the other so that he may lean forward, without overbalancing himself, while the patient's arms are carried outwards until they are in line with each other, and with the transverse diameter

of the chest. The operator then places his hands, with a similar disposition of the thumb and forefinger, on the palmar surfaces of the patient's wrist, and



FIG. 16.



FIG. 17.

offers resistance while the arms and hands are being brought back to the position from which they started. (Fig. 17).

No. 2.—The arm and hand of one side at a time are extended in the depending position, with the palm of the hand directed forwards, and the operator, standing at the patient's side, places his open hand on the palmar surface of the patient's wrist, the

thumb only being on the dorsal surface (Fig. 18). The patient then flexes the forearm, without movement of the upper arm, until the fingers come into contact with the shoulder. The operator then places



FIG. 18.



FIG. 19.

the palmar surface of his own hand on the dorsal surface of the wrist, and maintains it there while the flexed arm is being extended to the position from which the movement commenced (Fig. 19).

No. 3.—The arms are extended vertically in the depending position, with the palms of the hands turned forwards. After they have been raised outwards until the thumbs meet over the head, they are

brought back to the original position. The operator faces the patient, and resists the upward movement



FIG. 20.



FIG. 21.

on the radial side of the wrist (Fig. 20), and the downward movement on the ulnar side (Fig. 21).

No. 4.—The hands, with fingers flexed from the end of the first phalanx in such a manner that the second phalanges of the respective fingers of the two hands are in apposition with their fellows of the opposite side, are pressed together in front of the lower part of the abdomen. The thumbs are extended, and lie within

the three sides of a rectangle formed by the flexed forefingers, and touch each other at their tips (Fig. 22). The arms are then raised until the hands are on a level with the vertex of the head. Resistance is offered by placing the hands on the radial surface of the wrists. The movement is then reversed.



FIG. 22.

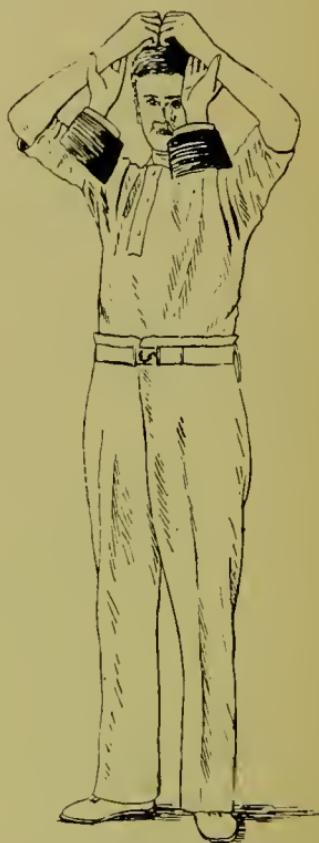


FIG. 23.

Before the return movement is performed the operator changes the position of his hands so as to receive the wrists in the fork between his thumb and forefinger, the palmar surface of his fingers being applied to the palmar surface of the patient's wrists (Fig. 23).

No. 5.—The extended arms are placed in the depending position, with the palms of the hands

resting against the thighs. They are then raised in parallel planes until vertically extended. The movement is then reversed. The operator faces the patient, and in order that he may maintain an uniform and effectual resistance, the relation of his hands to the patient's wrists must pass through the



FIG. 24.

following changes: In the first position the fork between his thumb and forefinger must be applied to the radial part of the wrist (Fig. 24). As the arms rise to an angle of 45° to the body, his fingers glide round the wrist until they are lightly folded round the radial surface of the wrists. Before the reverse movement commences he receives the

ulnar aspect of the wrist in the fork between his thumb and forefinger (Fig. 25). While the arms are descending his thumbs move outwards, and, at the same time, the fingers glide round the dorsal surfacee of the wrist in a direetion opposite to that whieh his thumb is taking, in such a manner, and at



FIG. 25.



FIG. 26.

such a rate, that, when the patient's arms are on a level with the shoulders, the ulnar aspect of the wrist rests on a reversed fork formed by the radial aspeet of operator's forefingers, and the thumb pushed out to a right angle with the somewhat flexed fingers (Fig. 26). As the hands desend towards

the thigh the tips of the operator's fingers gradually glide round to the ulnar aspect of the wrist, so as to resist the downward and backward movement of the arms. This is the operator's *pons asinorum*, but it should be mastered.

No. 6.—The trunk is flexed forward, without the knees being bent, and then brought back to the erect



FIG. 27.



FIG. 28.

position. The operator stands at the patient's side with one hand over the upper third of the sternum, and the other supporting the mid-lumbar region. (Fig. 27). The reverse movement is resisted by placing one hand over the junction of the cervical and dorsal portions of the spine (Fig. 28).

No. 7.—The trunk is rotated, without movement of the feet, as far as it can be carried to one side, say to the right, then to the left, and lastly brought back to face forwards as at starting. The movements are resisted by one hand being placed in front of, and a little above, the advancing axilla, while the other is



FIG. 29.

placed over the receding shoulder (Fig. 29). The operator must, to a limited extent, move round the patient when the second stage of the rotation is being performed, and will be able to do so most evenly and securely by carrying one foot round behind the other,

somewhat as is done in performing the skating "outside edge backwards," before shifting the position of the other.

No. 8.—The trunk is flexed laterally, first to one side, secondly completely over to the other, and thirdly brought back to the erect position. The



FIG. 30.

operator stands in front of the patient. When the movement is to the right, his left hand is pressed against the right side of the chest in the axilla, while the right firmly supports the opposite hip, and *vice versa* (Fig. 30).

No. 9.—This movement is identieal with No. 1, with the excepection that while it is being executed the fists are kept firmly clenched.

No. 10.—The arms are flexed in succession as in movement No. 2, with this differenee, that the



FIG. 31.

palmar surfacee is turned outwards and the fist is firmly clenched (Fig. 31).

No. 11.—The arm is extended in the depending position, the palm of the hand lying against the thigh, and then makes a eonplete revolution from

the shoulder joint, forwards and upwards, until it is vertically raised alongside of the ear. Before it descends backwards, the palm of the hand should be turned outwards (Fig. 32). The operator stands at the patient's side with his fingers folded round the



FIG. 32.

radial side of the wrist. His other hand must be ready to receive the wrist when it reaches the vertical position, and to maintain the resistance until the arm has descended to the position from which it started. This movement is performed by one arm at a time.

No. 12.—The arms are extended vertically in the depending position, the palms of the hands resting against the thighs. They are then moved upwards and backwards in parallel planes as far as it is possible



FIG. 33.

to do so without bending the trunk forwards. The upward movement is resisted with the fork of the hand on the ulnar aspect of the wrist, the downward, by folding the fingers round the radial surface (Fig. 33).

No. 13.—The patient stands with one hand resting on a chair or table, while the thigh of the opposite side is flexed on the trunk to the extreme limit, and then extended until the feet are side by side. The



FIG. 34.

leg should hang downwards from the knee-joint. The upward movement is resisted by a hand placed immediately above the knee (Fig. 34). The return

may be resisted by a hand placed below the lower part of the thigh or under the sole of the foot.

No. 14.—The patient, supporting himself with



FIG. 35.

one hand, as in the last movement, bends the whole extended lower extremities in succession, first for-

wards to the extreme limit of movement, then backwards to the same degree, and finally brings the one foot alongside of the other. The forward movements



FIG. 36.

are resisted in front of and above the ankle (Figs. 35, 36), the backward movements behind.

No. 15.—The patient, supported in front by a chair or table, stands on either foot in succession,



FIG. 37.

while the leg of the other side is flexed on the thigh. The upward movement is resisted by pressure on the heel (Fig. 37), the return movement above the instep.

No. 16.—The patient, resting one hand on a chair and standing on the foot of the same side, raises the

extended lower extremities in succession, outwards from the hip joint, and then reverses the movement.



FIG. 38.

The operator resists by means of one hand placed above the ankle (Fig. 38).

No. 17.—The arms, extended horizontally outwards, are rotated from the shoulder-joint to the extreme limits, forwards and backwards. The move-

ments may be resisted by the operator grasping the ulnar edge of the metaearpal portion of the hand



FIG. 39.

(Fig. 39), or by closing his thumb and forefinger in a ring round the wrist.

No. 18.—The hands, in succession, are first extended, then flexed on the forearm to the extreme limits, and lastly brought into line with the arm.

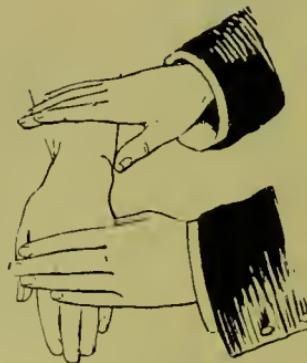


FIG. 40.

The operator's one hand supports the wrist, while the other resists the movements at the metaearphalangeal junction, first on the dorsal, secondly on the palmar, and thirdly again on the dorsal surface (Fig. 40).

No. 19.—The feet, in succession, are flexed and extended to the extreme limits, and then brought back to their natural position. The movements are resisted in the dorsal and plantar surfaces, at about

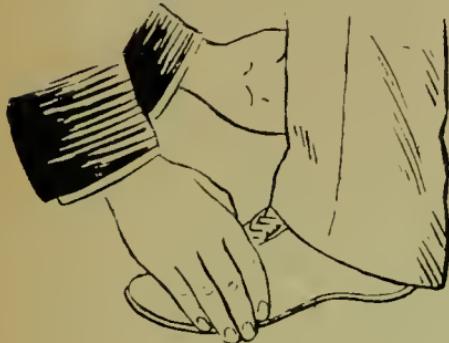


FIG. 41.

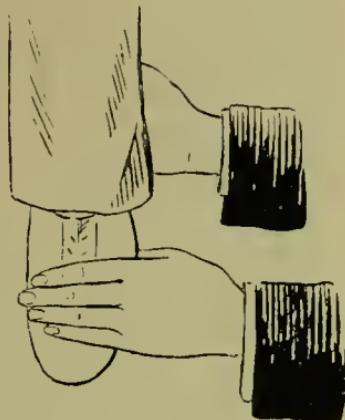


FIG. 42.

the level of the metatarso-phalangeal joints (Figs. 41, 42).

Such being the mechanical details of these wonder-working movements, it is not surprising that, on making acquaintance with them, the patient asks, with scarcely veiled scepticism, why a wash in the "waters of Jordan" should not be equally effectual. No question could be more apposite, no allusion more appropriate. Many days have not passed before results too manifest to be mistaken offer an unequivocal reply. At the same time, no greater mistake could be made than to assume that the mastery of mechanical details is a sufficient equipment for either the physician or the operator, for in no two cases is their expert and judicious application likely to be precisely similar.

In the first place it should be understood that there

is no magic in the exact sequence which has been adopted in the foregoing description. Many patients are, at the beginning, unable to perform the full series without experiencing what is always to be avoided—namely, fatigue or distress as exhibited by one or more of the symptoms which have been enumerated. Others cannot with advantage submit at once to movements of some special parts, such as the trunk or lower extremities. Some who are confined to bed cannot, in the nature of things, execute a portion of the exercises. In all such respects it devolves on the medical adviser to instruct the operator. The time to be occupied by the several movements, the duration of the interval of rest, and the measure of resistance to be offered, are points on which his judgment should be expressed. For that reason he should always be present when the first exercises are administered, and, in many cases, it will be advisable for him to conduct a few movements himself, and then, having gauged the patient's powers and capacity, to administer them to the assistant in order that his estimate of the required rate of movement and degree of resistance may be placed beyond the possibility of misapprehension. It needs not to be said that the medical attendant should, in all cases, submit the patient to an exhaustive preliminary examination. More especially is this the case where there exists any impediment to the rapid filling of the expanding arteries and capillaries. Should, for example, the pulmonary circuit be obstructed, as it is in cases of emphysema and asthma, and with rigidity or stenosis of the aortic orifice, syncope may be easily induced. In presence of such conditions, the resistance should be limited to feather weight, the movements slowly executed, and the intervals prolonged to allow the heart and vessels

time for the adjustment of their mutual relations to the changes which are being rapidly effected in the flow and distribution of the blood. It may even be desirable to enforce the recumbent position lest the pressure in the cerebral vessels be unduly lowered by the imperative requirements of the increasing vascular capacity. If the right side of the heart be overloaded, a down-grade should not, at first, be given to the brachial veins by raising the arms above the level of the shoulders. Briefly, the system under consideration brings such powerful influences to bear on the whole circulation, that, in application, it requires to be adapted to the exact condition of each individual. As with other potent remedies, the "rule of thumb" may easily convert a therapeutic agent into an instrument of mischief. No less care should be taken in the selection, instruction, and supervision of operators. They should be intelligent, light of hand, endowed with powers of observation, and trained to use them. The choice of women is not limited. Trained and even "registered" nurses who possess a knowledge of elementary anatomy and physiology, and whose faculties have been cultivated by hospital service, abound in our country; but suitable men are not easily found. Under no circumstances would it be justifiable to administer a course of either baths or exercises otherwise than under medical sanction and direction. With regard to treatment, although the physical method relegates pharmaceutical remedies to the rank of auxiliaries, their influence is, in some instances, of material value in correcting a special defect of health or in raising the general tone of the system. The patient's daily life often needs regulation, more especially in regard to exercise, fresh air, and the avoidance of undue fatigue, excitement, anxiety, mental distress, and all

other depressing conditions. Diet, however, is a matter of scarcely secondary importance. The condition into which most patients have fallen, and the acceleration of tissue change whieh the bath and exereiscs alike induce, demand a liberal supply of muscle-forming nourishment, comprising, generally, animal food, though not of necessity butchers' meat, three times daily. If there be a class of subjects with regard to whom the adjustment of the dietary claims exceptional care, it is that numerous one in which a tendency to the excessive deposit of adipose tissue is the aeeompaniment of anaemia or of some other dyspepsia. With them, the substitution of animal food for a considerable proportion of the fats and carbohydrates in common use, is a measure of great importance. A judiciously devised "thinning," but not "lowering," diet lightens the corporeal burden, gives free play to the muscles, and strengthens the heart to an extent whieh can hardly be accounted for by the mere removal of superincumbent fat. It should be added that those who have had the widest experiencee of the Schott methods attach no importance whatever to speeial limitation of the quantity of fluids ingested, and that graduated mountain climbing, as recommended by Oertel, should only be resorted to towards the end of the treatment or after it has been brought to a satisfactory conclusion. It then forms the rational complement of the treatment. Physical exereise, practised by means of meehanieal appliances, forms no part of the system, and introduces principles which are not only foreign to its conception but essentially opposed to it.

It now remains to be said that exercises with "self-imposed resistance" are often found to be of value as an after-treatment, more espeially as they are within the competence of everyone who has become ac-

quainted with the movements, and involve no risk of injury by over-exertion. "Selbst-hemmungs-gymnastik" or self-restraining gymnastics, were devised to enable patients to be, if one may so express it, their own operators. The restraint or resistance is effected by that hardening of the muscles of the limbs, or groups of muscles, which execute the movements, of which the condition of the forearm produced by firmly clenching the fist is an example. After a little practice the patient can induce that condition at will, and maintain it throughout the several movements, especially those of the arms and legs.

It would be unbecoming to close these observations without offering a tribute of admiration to the industry and genius which August and Theodor Schott have displayed in devising and elaborating means at once so simple and so effectual for the relief of a large measure of disablement and disease, and, at the same time, acknowledging the generous spirit in which they have, consistently with the most honourable professional ethics, made every effort to bestow the fruit of their labours on the medical profession at large for the benefit of suffering mankind.

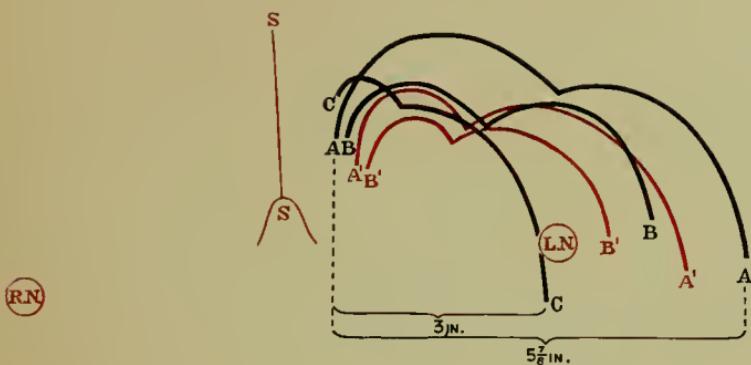
CHAPTER VI.

ILLUSTRATIVE CASES.

A., a lady, aged twenty-seven, had resided for four years in one of the semi-tropical States of America. Had suffered frequent accesses of tertian fever, which throughout the summer of 1893 had continued in unbroken series. Presented intense anaemia, dyspnœa on exertion, and sallow complexion. Suffered continuous headache and chronic intestinal catarrh, to which she had been liable for years. At the termination of the course the anaemia was completely relieved. The headache and dyspnœa were relieved by the end of the first week. The intestinal catarrh was pharmaceutically treated and relieved, but showed a tendency to return on slight provocation. Four months after the completion of the course the improvement was found to have been maintained.

NOTE.—*Areas of cardiac dulness and apex beats indicated by red lines and crosses, respectively, refer to observations made after either baths or exercises.*

DIAGRAM A.



A A and A' A', areas of cardiac dulness before and after first exercises (1 to 13).

B B and B' B', areas of cardiac dulness before and after last series of exercises at end of third week.

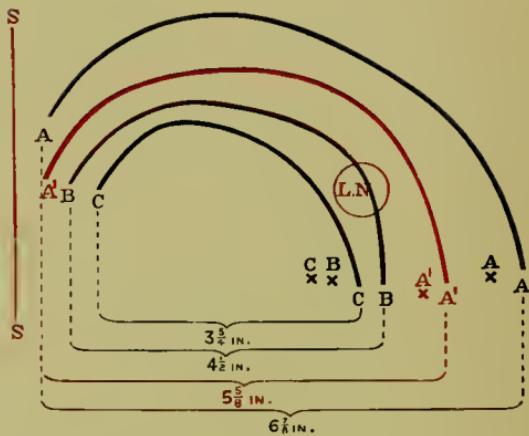
C C, area of cardiac dulness on termination of four weeks' course.

R.N. and L.N., right and left nipples.

S S, mid-sternal line.

DIAGRAM B.

(R.N.)



A A, area of cardiac dulness before first exercises.

A¹ A¹, the same after twenty minutes' exercises.

B B, the same after completion of the course, thirty-one days later.

C C, the same eighty days after completion of the course.

× A and × positions of apex beat at corresponding stages.

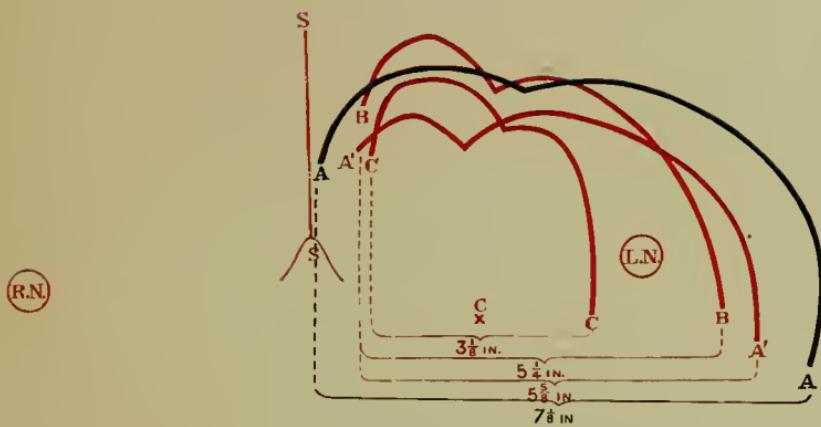
R.N. and L.N., right and left nipples.

S S, mid-sternal line.

B., aged sixty-five, had rarely smoked less than twenty cigars a day during a thirty years' residence in India, and was found to be unduly stout, with pale and drawn face, and light bluish lips. He could not walk a hundred yards without stopping to recover his breath, nor ascend a flight of stairs without resting, supported on the banister, for the same purpose. He was dieted to reduce his weight and correct gastric fermentation, and treated by exercises. Before the completion of the course his aspect and expression had changed, and his face and lips became ruddy; he walked daily to and from his club, a distance of five miles in all, and there played billiards for two or three hours, and could run up stairs without becoming breathless. In weight he lost a pound a week for six weeks. Nine months after the conclusion of the treatment, he was fishing and shooting in Norway, and now smokes, on an average, six small cigars a day.

C., aged fifty, had presented symptoms of cardiac failure for at least twenty years, and had been liable for four years to accesses of partial syncopæ, associated with gastric distension and intense vertigo. The treatment by exercises commenced a few days after recovery from the last such attack. On the conclusion of the course, the patient summarised the change in her condition as follows : " Before the treatment my sensations frequently forced upon me the apprehension of impending death, my digestion was bad, and every exertion of mind and body seemed to be too tiring to be endured. Now I walk for at least an hour twice daily. I can eat and drink anything in reason, and I am a stranger to fatigue and depression of spirits." Four months after the completion of the treatment the improvement was more than maintained. The patient had crossed a mountain pass at an altitude of more than 7,000 feet, in a snowstorm, without the breathing being affected, or experiencing any inconvenience.

DIAGRAM C.



A A and A' A', areas of dulness before and after exercises. (Pulse reduced from 84 to 76.)

B B, area of dulness after twelfth exercises (the fourth, after an interval of fourteen days, necessitated by the menstrual period).

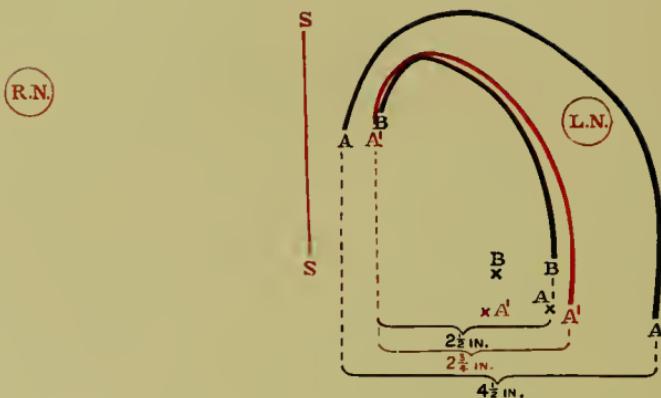
C C, the same after twenty-fifth and last exercises.

Cx, situation of apex beat on that occasion (not having been appreciable when previous observations were recorded).

R.N. and L.N., right and left nipples.

S S, mid-sternal line.

DIAGRAM D.



A A and $\text{A}'\text{A}'$, areas of cardiac dulness before and after first exercises. (Pulse reduced from 108 to 104.)

B B, area of cardiac dulness twenty hours after completion of the course. (Pulse 84, after going up and down two flights of stairs.)

$\times \text{A}'$, $\text{A} \times$, and $\text{B} \times$, positions of apex beat at corresponding stages.

R.N. and L.N. right and left nipples.

S S, mid-sternal line.

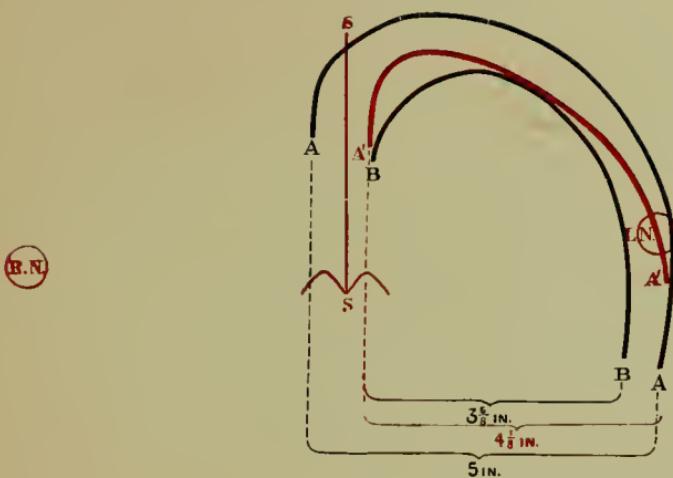
D., aged eighteen, 5 ft. 10 in. in height, had a first access of influenza in 1890, and a second in 1892. The latter was followed by loss of ocular accommodation, as well as cardiac weakness and vertigo which became so severe, about three weeks after the termination of the febrile state, that he was obliged to take to his bed, and there lay with a basin at his side, because an incautious movement of the head, or even the automatic fixing of the eyes on a crack in the ceiling, except while wearing convex lenses, brought on an attack of retching. From that time forward he was debarred from participation in all games and sports, as any exertion beyond a leisurely walk brought on palpitation, praecordial pain, and dyspnœa. On the 28th of February, 1894, he commenced a course of exercises which extended to the 24th of March, inclusive, after which he returned to the country. A month later I received the following report:—In active pursuits he is now on a level with other young men of his age. His tutor reports that in power of application, and in memory, he is twice the man he was; but the most remarkable change is in his spirits, for, whereas the word “ beastly ” used to be freely scattered through his letters, everything in life is now said to be “ awfully jolly.”

E.—The following case is published by permission of Dr. James Harper, with whom I saw the patient six weeks after the termination of the acute stage of influenza. She was twenty years of age, and had not gained in strength or power of movement from the time of leaving her bed. She was found to be very anaemic, somewhat wasted, and could only move from one room to another adjoining, at the cost of dyspnoea and praecordial pain. A well-marked systolic bruit was audible at the base. I administered exercises very slowly, with gentle resistance, and long intervals, for the space of fifteen minutes in all. The areas of dulness were traced by Dr. Harper, who also recorded the following observations :—

Dec. 12, 1893.	Before exercises,	P. 96,	murmur distinctly audible.
	After	P. 84,	„ scarcely „
„ 14, „	Before	„	fairly marked.
	After 20 m.	„	scarcely audible.
„ 18, „	Before	P. 84-120 „	audible. <small>(very variable).</small>
	After 20 m.	P. 84,	„ not audible.
„ 28, „	" "	P. 92,	no bruit.
Jan. 1, 1894.	Before	P. 132,	„
	After 24 m.	P. 84,	„
„ 4, „	" "	P. 84,	„
„ 9, „	" $\frac{1}{2}$ -hour's „	P. 96,	„
„ 12, „	Before exercises,	P. 96,	„

After the completion of the course the patient travelled by rail from Victoria station to South Kensington, whence she walked to my house. She presented the appearance, and enjoyed the sensations of perfect health. The pulse was 88, and I could discover no bruit.

DIAGRAM E.



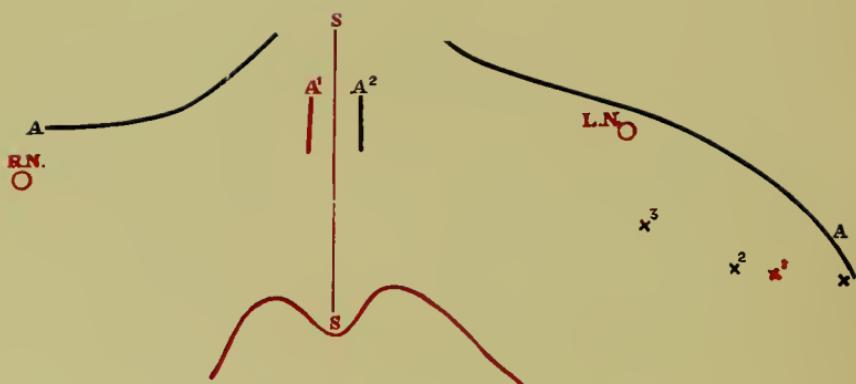
A A and **A¹ A¹**, areas of cardiac dulness before and after fifteen minutes' exercises, with gentle resistance.

B B, the same at the conclusion of a course extending over thirty-one days.

R.N. and **L.N.**, right and left nipples.

S S, mid-sternal line.

DIAGRAM F.



A A, area of dulness before exercises.

A^1 , right margin of area of dulness after twenty-five minutes' exercises, with slight resistance.

A^2 , the same, after five more movements, with strong resistance.

x , x^1 , x^2 , positions of apex beat at corresponding stages.

x^3 , apex beat as observed by the writer after twenty-five days' treatment by baths and exercises.

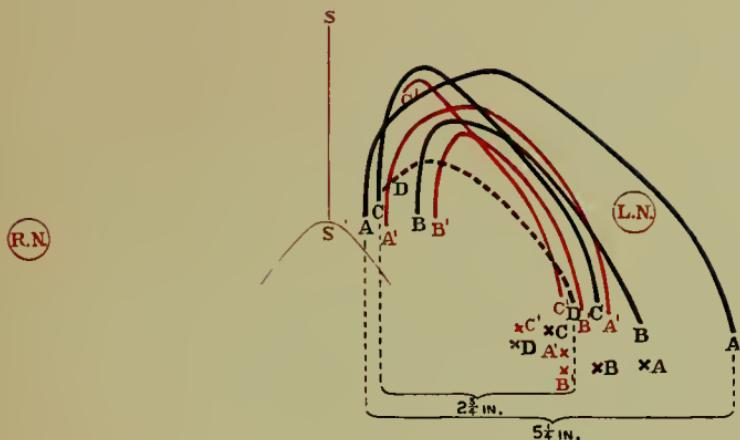
R.N. and L.N., right and left nipples.

S S, mid-sternal line.

F., aged fifty-three, was examined in the presence of Dr. Heinemann, of New York, and myself by Dr. Pawinski, of Warsaw, who kindly sanctions the present use of his observations and tracings. A well-marked systolic bruit at the base, followed by a diastolic souffle in the same situation, were taken to indicate aortic stenosis with insufficiency. The patient suffered from dyspnoea, œdema of the lower extremities, and enlargement of the liver. When I examined him twenty-five days later, the systolic bruit was of diminished intensity, the diastolic souffle was no longer audible, there was no dyspnoea, and the œdema had passed away.

G., aged sixty-seven, had been known for four years to present symptoms of aortic stenosis, but had good compensation and led an active life. He came under observation again on March 8, 1894, some weeks after suffering from symptoms which suggested an attack of influenza. His face was drawn and anxious, and he complained of dyspnœa on exertion, and of great loss of mental and physical energy. On auscultation the basic-systolic bruit was found to have become louder, and to it was superadded a well-marked apex-systolic murmur. The first exercises reduced the pulse from 60 to 50, and increased its force and volume. After seven days (B) he left London much improved, both murmurs being audible but reduced in intensity. Resumed the treatment after an interval of twenty-six days (C), enjoying at the time good general health and complete freedom from dyspnœa. The first exercises of this series reduced the pulse from 72 to 44. In ten more days the treatment was brought to a conclusion by the necessity of leaving London again. By that time the apex bruit had been superseded by a sound which, but for a slight lack of definition, was healthy. Eighty-five days later the area dulness was found to be as indicated by D. The basic bruit was reduced to its old intensity; the apex sound remained as when last observed. The pulse was 52. The general condition left nothing to be desired. The greater part of the members of this patient's family have, in health, a pulse of about 50.

DIAGRAM G.



A A and $A^1 A^1$, areas of dulness before and after first exercises.

B B and $B^1 B^1$, areas of dulness on seventh day before and after exercises.

C C and $C^1 C^1$, areas of dulness before and after exercises after an interval of twenty-six days.

D D, area of dulness eighty-five days after conclusion of treatment.

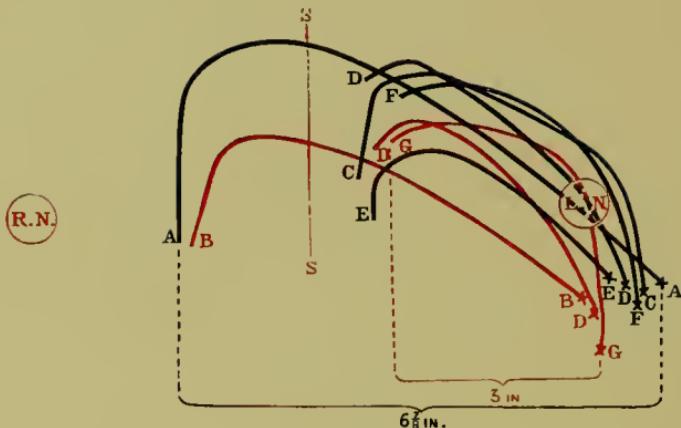
R.N. and L.N., right and left nipples.

S S, mid-sternal line.

$\times A$, $\times B$, etc., positions of apex beat at stages corresponding to letters A, B, C, and D.

$\times A^1$, $\times B^1$, etc., positions of apex beat at stages corresponding to letters A^1 , B^1 , and C^1 .

DIAGRAM H.

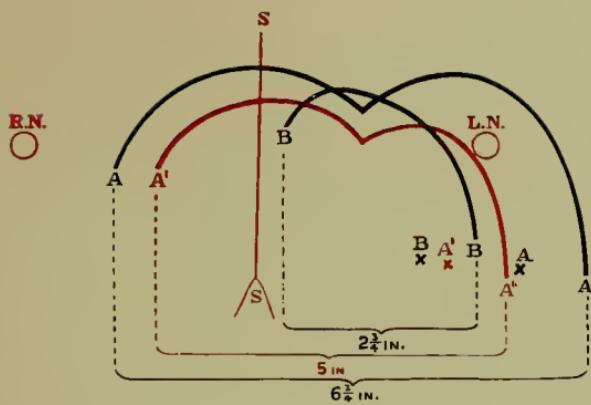


December 7th. A A, before exercises.
 B B, after twenty minutes.
 " 9th. C C, before exercises.
 " 12th. D D, before exercises, after being out three and a-half hours and returning in a gale.
 D D, after half-an-hour's exercises.
 " 14th. E E, before exercises, and after six and a-half hours' absence from home on professional duty.
 " 25th. F F, before exercises.
 January 3rd. G G, three hours after exercises.
 R.N. and L.N., right and left nipples.
 S S, mid-sternal line.

H., aged fifty-nine, who had for many years been the subject of heart troubles associated with a loud apex-systolic bruit, and exophthalmos, was found on December 3rd, 1893, to be suffering from acute pulmonary apoplexy. The pulse was bigeminous, two beats corresponding to each complete respiratory act. He was at once instructed to practise the arm exercises with self-imposed restraint, and ordered digitalis and strychnia. On the 7th, he was moving about the drawing-room, and commenced a course of exercises resisted by a trained operator. On the 12th, he went to his office and was from home for three and a-half hours. He has since been three times under similar treatment for slight œdema of the lower extremities, but continues to lead an active professional life.

I., aged sixteen, is reported to have had carditis in the course of scarlet fever, at the age of five, followed by haemato-albuminuria and oedema. Whooping cough, at the age of six, was followed by chorea of moderate intensity, which lasted for a year. A second attack, lasting four months, occurred at the age of seven. When first seen he was under treatment by Mr. Barwell for spinal curvature. He had a loud systolic-apex bruit, with a well-marked and diffused thrill, and epigastric pulsation perceptible to sight as well as touch. His parents had been advised to remove him from school, and not to allow him to leave the house otherwise than in an invalid chair or pony-chaise. After the exercises on the twenty-first day of treatment he trotted about a hundred and twenty yards and then walked fifty. Before doing so the pulse was 66, and the respirations were 20; afterwards they were respectively 86 and 19. He experienced no fatigue, and showed no signs of distress. At the conclusion of a course extending over twenty-eight days he trotted two hundred yards. Before doing so the pulse was 66, and the respirations were 16; afterwards they were 80 and 18 respectively. He was, at that time, taking walks of one and two hours' duration without fatigue, and, generally, leading an active life, though debarred from running more than a few paces, and from joining in out-door games. The areas of dulness before, and at the conclusion of, the treatment were verified by Mr. Barwell, who also noted a much diminished apex impulse and complete absence of thrill and epigastric pulsation. The bruit had diminished, but was still well marked.

DIAGRAM I.



A A and A' A', areas of cardiac dulness before and after first exercises.
A X and A' X, apex beats before and after.

BB, area of cardiac dulness on completion of course twenty-eight days later.

B X, apex beat.

R.N. and L.N., right and left nipples.

S S, mid-sternal line.

J.—I am enabled, by the courtesy of Sir Philip C. Smyly, to quote *in extenso* the following case from his article already alluded to:—*

Miss X., æt. seventeen, had been ailing for some time.

Oet. 20th, 1893.—She had an attack of faintness and swelling of the feet and ankles.

Feb. 24th, 1894.—She came under my care. She was very low and weak; anaemia; hands and feet oedematous and very blue; general anasarca; ascites well marked, and fluid in both pleurae. The area of the heart dulness was well defined to the right side of the sternum, but could not be outlined below or to the left side on account of the dulness from the pleural effusion. The skin was white and waxy on the forehead, ears, and neck. The cheeks were a dark purple-blue. After a very careful examination the diagnosis arrived at was—Dilated heart with patent foramen ovale (possibly); obstructed arterial circulation, with venous congestion of all the organs. No albumen in the urine. Began the resisted movements for twenty minutes every morning about 11 o'clock, and massage by an experienced masseuse every evening. The colour improved every day. area of dulness diminished, and the pulse became fuller and less frequent. The blue colour improved to a dark red.

Mareh 8th.—In the daily report it was noted:—“She did some additional exercises with more strength. Her pulse was considerably stronger. Her nose bled slightly. She passed a cheerful day.”

11th.—“Marked improvement in the pulse. Her colour keeps good all day; very little blue at any time.”

* *Dublin Journal of Medical Science*, September, 1894.

17th.—Remarked the healthier appearance of the forehead, ears, and neck.

(From the 20th of March until the 11th of April the movements were omitted—unavoidably—though the massage was continued.)

21st.—“Not a good night—restless and dreaming. Appetite very poor.”

April 5th.—“Her colour was very dark with much blue in the morning; got right in the afternoon. Urine very scanty.”

6th.—“Swelling of the abdomen greatly increased. Only eleven ounces of urine in twenty-four hours.”

11th.—Pain in the right side. Movements begun again, but very slightly, owing to great distress in breathing. Urine, eleven ounces.

12th.—Pain worse. Much swelling; could not lie down in bed. Urine, thirteen ounces. Daily exercises and steady improvement.

20th.—“Better. Urine, thirty-one ounces in twenty-four hours.”

22nd.—“The heart rhythm was normal for the first time.”

25th.—“The menses showed for the first time since October, and continued slightly for five or six days.”

26th.—The patient was moved from one house to another. On being lifted into the carriage she became breathless and very blue. Towards evening she breathed better, but could not lie down. She got little or no sleep, and had to be supported sitting up all night.

28th.—The whole of the right pleura was full. Distress of the breathing rapidly increasing. Assisted by Dr. Cruise, I tapped the chest and drew off sixty-two ounces of fluid, clear and yellow. She coughed

up a quantity of thin mucus during the afternoon. Temperature 100°. At 10 o'clock, p.m., the temperature was 99°. She could lie down in bed with only two pillows.

May 4th.—Consultation with Dr. Cruise. She was very much improved. Movements were resumed.

11th.—“Was very cheerful all day. Colour a little high, but no blue.”

21st.—Left Dublin, 7 p.m., for Holyhead. Next day to London, and on Wednesday had a consultation with Dr. Bezly Thorne.

26th.—Arrived at Nauheim better than when she left Dublin.

28th.—Had her first bath.

June 1st.—Pulse before the bath, 116; after, 110.

8th.—Dr. Schott showed the patient's mother “that the water had gone down a hand's breadth over her stomach.”

20th.—Began the gymnastics. From standing during the examination, and the marking out the area of dulness, her pulse was 114; after the exercises it fell to 88, and then rose to 96, and then to 104.

21st.—I saw the patient at Nauheim with Dr. Th. Schott. I could not find any sign of fluid either in the chest or in the peritoneum. No œdema; and the heart's action normal.

July 6th.—Dr. Schott reports the heart very well.

29th.—Dr. Bezly Thorne saw the patient in London, and reports—“Wonderfully improved. Cannot detect any wrong sound in her heart.”

30th.—Dr. Cruise and I very carefully examined the patient together, and found the heart's action normal, and no swelling anywhere. She returned home to all appearance quite well.

At an early part of this case it was mentioned that it appeared possible, from the extreme cyanosis, that

some patency of the foramen existed. It is, however, quite possible that this may have been remedied by the contraction of the dilated heart, and consequent valvular closure of the foramen.

“ 93, MERRION SQUARE,
“ *August 9th, 1894.*

“ DEAR SIR PHILIP,

“ Having read your paper on the treatment of enlarged heart by movements of the system of the brothers Schott, I beg to add a short note, which, if you wish, you can publish.

“ As you know I saw your patient in the most critical portion of her illness, and learned, for the first time, what can be done by these movements, and in confirmation of what you succeeded in accomplishing in a young girl, I now beg to report my own experience of the treatment in a very aged patient.

“ Within the last month I met Dr. O'Donoghoe, of Baldoyle, in relation to the case of a very aged gentleman, who was suffering extreme distress of breathing and loss of sleep from a weak dilated heart.

“ In addition to the administration of iron and digitalis, and stimulation by a small blister, I used the resisted movements of the arms, and I showed them to Dr. O'D., who fully appreciated their object and value. He and some of the patient's family have still continued them, and the patient is totally changed for the better—sleeps well, has recovered his appetite, and physically shows increased impulse and diminished area of cardiac dulness.

“ I remain, my dear Sir Philip,
“ Yours most faithfully,
“ F. R. CRUISE.”

On the 19th of September Sir Philip reported:—
“X. is wonderful—riding, driving, and boating.” He draws attention to the following points, which this case brings into prominence:

1. The importance of the movements without the baths, followed by such an improvement that the patient was able to undertake the journey to Nauheim.
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